CLAIMS

What is claimed is:

1. A method of transmitting computer data between a host computer and at least one computer data storage device by inserting a multiple-path driver between driver-stack levels of an operating system operating on said host computer comprising:

selectively redirecting device commands from upper-level drivers of said operating system of said host computer to said multiple-path driver;

creating a virtual data path between said multiple-path driver and said computer data storage devices;

selectively directing device commands from said multiple-path driver to a virtual host bus adapter driver within said multiple-path driver along said virtual path;

transmitting computer data along more than one physical path between said multiple-path driver and said computer data storage devices; and,

selectively presenting said computer data storage devices to said upper-level drivers of said operating system of said host computer as a single virtual computer data storage device.

2. A method of claim 1 further comprising the step of:
utilizing at least one array of computer hard disks as said computer data storage devices.

3. A method of claim 1 further comprising the step of:

inserting a part of said multiple-path driver between middle-level device drivers of said operating system of said host computer and host bus adapter drivers of said operating system of said host computer; and,

inserting an additional part of said multiple-path driver into said upper-level device drivers of said operating system of said host computer to interface with said middle-level device drivers of said operating system of said host computer.

4. A method of transmitting computer data between a host computer and at least one computer data storage device by utilizing a multiple-path driver inserted between driver-stack levels of a Linux operating system of said host computer comprising:

selectively redirecting device commands from upper-level drivers of said Linux operating system of said host computer to said multiple-path driver;

creating a virtual data path between said multiple-path driver and said computer data storage devices;

selectively directing device commands from said multiple-path driver of said Linux operating system of said host computer to a virtual host bus adapter driver within said multiple-path driver along said virtual path;

transmitting computer data along more than one physical path between said multiple-path driver and said computer data storage devices; and

selectively presenting said computer data storage devices to said upper-level drivers of said Linux operating system of said host computer as a single virtual computer data storage device.

5. A method of claim 4 wherein said step of selectively redirecting device commands from upper-level drivers of said Linux operating system of said host computer to said multiple-path driver further comprises:

selectively redirecting SD device driver commands and SG device driver commands within said Linux operating system of said host computer.

6. A method of transmitting computer data between a host computer and at least one array of computer hard disks by utilizing a multiple-path driver comprising:

inserting a part of a multiple-path device driver between middle-level device drivers of a Linux operating system of said host computer and host bus adapter drivers of said Linux operating system of said host computer;

inserting an additional part of said multiple-path driver into upper-level device drivers of said Linux operating system of said host computer to interface with middle-level device drivers of said Linux operating system of said host computer;

selectively redirecting SG device driver commands and SD device driver commands from said upper-level drivers of said Linux operating system of said host computer to said multiple-path driver;

creating a virtual data path between said multiple-path driver and said arrays of computer hard disks;

selectively directing said SG device driver commands and SD device driver device commands from said multiple-path driver to a virtual host bus adapter driver within said multiple-path driver along said virtual data path;

transmitting computer data along more than one physical path between said multiple-path driver and said computer data storage devices; and

selectively presenting said arrays of computer hard disks to said upper-level drivers of said Linux operating system of said host computer as a single virtual computer data storage device by using said virtual host bus adapter driver.

7. A system that transmits computer data along more than one physical data path between a host computer and at least one computer data storage device comprising:

a computer operating system that contains a driver stack that transmits commands from said host computer through said operating system to said computer data storage devices;

at least one host bus adapter that connects said computer operating system to said computer data storage devices;

at least one host bus adapter driver that directs said host bus adapters;

a multiple-path driver that transmits data along multiple physical paths between said host computer and said computer data storage devices by diverting device commands from said computer operating system to a virtual host bus adapter driver;

at least one controller that directs said computer data storage devices to acquire or transmit data;

at least one cable that connects said host bus adapters to said controllers of said computer data storage devices; and,

a set of buses that connect said controllers to said computer data storage devices and allow said computer data storage devices to acquire or transmit data.

8. The system of claim 7 wherein said computer data storage devices are comprised of arrays of computer hard disks.

9. The system of claim 7 wherein said computer operating system is a Linux operating system.

10. The system of claim 7 wherein a portion of said multiple-path driver is inserted between the middle-level device drivers of said Linux operating system of said computer and the host bus adapter drivers of said Linux operating system of host computer.

11. The system of claim 7 wherein a portion of said multiple-path driver is inserted into the upper-level device drivers of said Linux operating system of said computer to interface with the middle-level device drivers of said Linux operating system of host computer.

12. The system of claim 7 wherein said set of cables that connect said host bus adapters to said controllers of said computer data storage devices is electrical.

13. The system of claim 7 wherein said set of cables that connect said host bus adapters to said controllers of said computer data storage devices is fiber-channel.

14. A system that transmits computer data along more than one physical data path between a host computer and computer data storage devices comprising:

a Linux computer operating system that contains a driver stack that transmits commands from said host computer through said operating system to said computer data storage devices;

a set of host bus adapters that connects said Linux computer operating system to said computer data storage devices comprised of arrays of computer hard disks;

a set of host bus adapter drivers that directs said host bus adapters;

a multiple-path driver that utilizes multiple paths for data flow between said host computer and said computer data storage devices by diverting device commands from said Linux computer operating system to a virtual host bus adapter;

a portion of said multiple-path driver that is inserted between the middle-level device drivers of said Linux operating system of said computer and the host bus adapter drivers of said Linux operating system of host computer;

an additional portion of said multiple-path driver that is inserted into the upper-level device drivers of said Linux operating system of said computer to interface with the middle-level device drivers of said Linux operating system of host computer

a set of controllers that direct said computer data storage devices to acquire or transmit data;

a set of cables that connect said host bus adapters to said controllers of said computer data storage devices; and,

a set of buses that connect said controllers to said computer data storage devices and allow said computer data storage devices to acquire or transmit data.

15. The system of claim 14 wherein said set of cables that connect said host bus adapters to said controllers of said computer data storage devices is electrical.

16. The system of claim 14 wherein said set of cables that connect said host bus adapters to said controllers of said computer data storage devices is fiber-channel.

17. A system that transmits computer data along more than one physical data path between a host computer and computer data storage devices comprising:

a means for transmitting commands from said host computer through a Linux computer operating system to said computer data storage devices using multiple paths;

a means for connecting said Linux computer operating system through host bus adapters to said computer data storage devices comprised of arrays of computer hard disks;

a means for directing said host bus adapters with host bus adapter drivers;

a means for utilizing multiple paths for data flow between said host computer and said computer data storage devices by diverting device commands from said Linux computer operating system to a virtual host bus adapter driver;

a controller means for directing said computer data storage devices to acquire or transmit data;

a means for connecting said host bus adapters to said computer data storage devices; and,

a means for connecting said controller means to said computer data storage devices and allowing said computer data storage devices to acquire or transmit data.